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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/801,544	03/17/2004	Kazuhisa Fukushima	042187	2323

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EXAMINER	
SISSON, BRADLEY L	

ART UNIT	PAPER NUMBER
1634	

NOTIFICATION DATE	DELIVERY MODE
08/19/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentmail@whda.com

Office Action Summary	Application No.	Applicant(s)	
	10/801,544	FUKUSHIMA, KAZUHISA	
	Examiner	Art Unit	
	Bradley L. Sisson	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 May 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,7 and 8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,7 and 8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1-3, 7, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 3,567,611 (Michel et al.) in view of US Patent Application Publication 2002/0058273 A1 (Shipwash), 2002/0155032 A1 (Liu et al.), US Patent Application Publication 2003/0027354 A1 (Geli), and US Patent Application Publication 2006/0127942 A1 (Straume et al.).

5. For purposes of examination, the method of claims 1 and 2 have been construed as optionally further comprising a step of performing magnetophoresis, while claim 7 explicitly requires its usage.

6. As presently worded, the method of claims 1-3, 7, and 8 require the use of a first and second solution (claim 1) or a first, second and third solution (claims 2, 3, 7, and 8). There is no requirement that the solutions be different from one another. Accordingly, the claims have been construed as encompassing use of two or three solution, wherein the solutions can all be the same.

7. For purposes of examination, the term "preserving" has been construed to encompass any period of time, no matter how small. Accordingly, the act of "preserving said target biopolymer" in a "first solution in said first area" (claim 1), or "in said third solution in said third area" (clams 2 or 7) has been construed as encompassing the period of time during and immediately following the act of separation/moving the target biopolymer into said fluid/area.

8. For purposes of examination, the aspect of a "partition" being "a gel, a pillar array, or a porous filter" (claims 1, 3 and 8) has been construed to encompass any gel, including polyacrylamide gels, and that the movement or separation of biopolymers from a first solution into a second solution/second area can be an arbitrarily selected region within the same gel. In support of this interpretation, it is noted that there is no requirement/limitation that the "partition", e.g., a gel, is any different in one area from that in any other area. Similarly, there is no limitation requiring that the solutions be different from one another.

9. While claim 1 requires filing a first area with a first solution and a second area with a second solution, such steps have been construed as encompassing simultaneous filling of two

areas (e.g., buffer chambers at opposite sides of a gel) with a common reagent in a simultaneous manner. Similarly, the filing of a first, second and third areas with a first, second and third solution has been construed as encompassing the use of a common buffer to fill chambers located at opposite ends of a gel where there are electrodes that permit running a gel in first one direction and then running the gel in a perpendicular manner, or the same buffer that is used to hydrate the gels, where one solution could be in one chamber, a second solution could be that in the gel, and a third solution could be in a different part of the gel/partitioned by a region within the gel and/or in a different chamber.. Again, a common reagent could be used and the three buffer chambers could be filled in a simultaneous manner.

10. The claims have also been construed as encompassing a method whereby one chamber is filled to the point where the buffer flows over the gel and on into different chamber(s).

11. Michel et al., column 1, state:

> The invention relates to partitioning techniques and refers more specifically to a method of partitioning human normal serum protein or the like by two-stage electromagnetophoresis as a function of molecular paramagnetism in which a material sample is electrophoresed and then magnetophoresed to provide displacement and grouping of molecules in accordance with their physical and electrical properties.

12. Michel et al., column 2, teach that the separation medium (applicant's partition) is a polyacrylamide gel. Such a showing meets a limitation of claims 1, 3 and 8.

13. Michel et al., column 2, disclose the protein being placed (applicant's injected) into a depression on one surface of the gel. Such a showing is deemed to meet a limitation of independent claims 1, 2, and 8.

14. Michel et al., Fig. 6, depicts conducting electrophoresis in one direction and then separating molecules by application of a force perpendicular to the original means of separation.

15. Michel et al., teach that the biopolymer may be attached to magnetic particles, and that the magnetic particles can be caused to move. Such a showing meets a limitation of claim 7.

16. The aspect that the separated, negatively-charged biopolymer was retained in the gel at least for a period of time that included imaging, is deemed to meet the limitation that the biopolymer was "preserved" (limitation of independent claims 1, 2, and 7).

17. Shipwash, paragraph [306], disclose performing 2-dimensional (2D) electrophoresis on a chip whereby proteins are isolated. This showing meets a limitation of claim 2.

18. Shipwash, FIG. 1A, depicts a multichannel pipette injecting samples into wells. Such a showing is deemed to meet a limitation of independent claims 1, 2, and 7.

19. Liu et al., paragraph [0011] teach that a wide variety of molecules can be isolated via capillary electrophoresis. Specifically identified are proteins and nucleic acids.

20. Liu et al., abstract, disclose performing electrophoresis of nucleic acids whereby a sample is "injected" into a solution present in a sample channel, and at paragraph [0033], Liu et al., disclose injecting fixed volumes of sample.

21. Liu et al., paragraph [0030], teach that a volume of sample is introduced into a sample channel. Such a showing is considered to meet a limitation of applicant's first solution.

22. Liu et al., paragraph [0032], teach that the device can be used in a method of continuous separation whereby three blocks (applicant's partition) are employed. The aspect of using three blocks speaks to three solutions and at least one partition.

23. Geli disclose a method and related device for separating biopolymers via electrophoresis. As seen in paragraph [0059], the device comprises an inlet port as well as an evacuation outlet, thereby allowing for the recovery and preservation of the isolated biopolymer.

24. Geli, paragraph [0191], discloses using "polymeric monoliths micro-rods" that are "appropriate for protein separation." Such a showing is deemed to meet the limitation of a "pillar array" as found in claims 3 and 8.

25. Straume et al., teach at length how magnetic beads can be coupled to any of a variety of biopolymers, including nucleic acids and proteins, and can be used to separate the bound biopolymer from other components in a sample.

26. Straume et al., page 12, disclose the use of beads in an electrophoretic medium, and that the beads can be coupled to nucleic acids.

27. Paragraph [0126] teaches that magnetic beads, when coupled to DNA, are able to move through a medium in response to electrophoretic force.

28. Straume et al., page 13, bridging to page 14, teaches separation of DNA from magnetic beads.

29. In view of the continued importance of separating biopolymers such as nuclei acids and proteins via electrophoresis (one dimensional or two-dimensional) as well as including magnetophoresis to further purify the biopolymer of interest, one of ordinary skill in the art at the time the invention was made would have been amply motivated to have modified the method of Michel et al., by combining the option of performing two-dimensional electrophoresis of Shipwash and further combining the aspect of sample injection (Liu et al.) as well as optionally using a pillar array (Geli) or gel (Michel et al., Shipwash) to effect separation of the biopolymer of interest. It would have also been obvious to one of ordinary skill in the art at the time of the invention to have employed the use of magnetic beads as disclosed by Straume et al., as such

would have significantly enhanced the magnetic properties of nucleic acids bound thereto, and thereby enhanced the sensitivity and efficiency of the assay.

30. In view of the explicit guidance that the disclosed methods are applicable to proteins and/or nucleic acids, said ordinary artisan would have had a most reasonable expectation of success.

31. For the above reasons, and in the absence of convincing evidence to the contrary, claims 1-3, 7, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 3,567,611 (Michel et al.) in view of US Patent Application Publication 2002/0058273 A1 (Shipwash), 2002/0155032 A1 (Liu et al.), US Patent Application Publication 2003/0027354 A1 (Geli) and US Patent Application Publication 2006/0127942 (Straume et al.).

Response to argument

32. At pages 7-8 of the response of 18 May 2009, hereinafter the response, applicant provides an analysis of each of the cited pieces of art. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

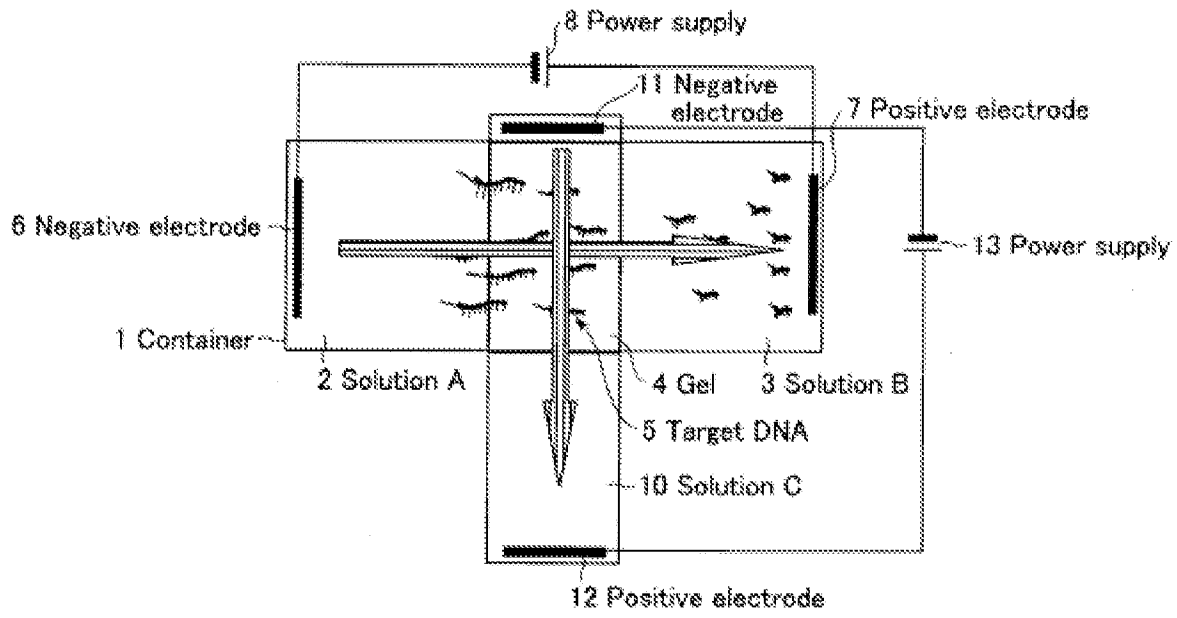
33. At page 9 of the response argument is presented that the art does not teach injecting the sample. The specification does not define "injecting" and the claims do not recite any element that further qualifies "injecting," e.g., into what is the sample being injected, and how the sample is being injected. More particularly, is any special equipment being used to effect this injection.

34. Michel et al., clearly teaches that the sample is placed into a depression of a gel, and Shipwash clearly teach using a multichannel pipette to deposit, if not inject, sample. Applicant has presented no evidence as to how the recited step of "injecting" is materially different from that of the prior art, and if materially different, is non-obvious over the prior art of record.

35. At page 9 of the response argument is presented that Michel does not each or suggest moving the target biopolymer into a second solution in the section area using electrophoresis. This argument is not found persuasive as applicant fails to take into consideration that Shipwash does teach performing this very aspect. Further, applicant at page 11 of the response fails to address how the teaching of Michel to first separate their negative biopolymer in one direction and to then separate it in a second direction via magnetophoresis is not obvious in view of the explicit teachings of Michel et al. where just such an act is being achieved.

36. At page 11 of the response applicant presents argument as to how Michel does not render the invention of claim 2 obvious, noting in particular the requirement that the first separation is performed in first device and the second separation is performed in a second device. As noted above, the aspect of a first and second device has been construed as actually being part of a common device. In support of this position is applicant's FIG. 2, which for convenience, is reproduced below.

FIG.2



37. As is readily apparent, the first and second devices are actually all part of a common device, and the three solutions can be the same solution found on the different sides/ends of the gel as inside/over the gel. In short, the two-device method is a method for performing 2-dimensional electrophoresis. Shipwash teaches this explicitly. A review of the response fails to identify where applicant has addressed this teaching.

38. Applicant's remarks fail to address the combined teachings of all of the cited art. As noted above, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

39. Attention is directed to the decision in *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d 1385 (U.S. 2007):

> When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill in the art has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense.

40. It is further noted that prior art is not limited to the four corners of the documentary prior art being applied. Prior art includes both the specialized understanding of one of ordinary skill in the art, and the common understanding of the layman. It includes "background knowledge possessed by a person having ordinary skill in the art. . . [A] court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *KSR* at 1396.

41. Suggestion, teaching or motivation does not have to be explicit and "may be found in any number of sources, including common knowledge, the prior art as a while or the nature of the problem itself'" *Pfizer, Inc. v. Apotex, Inc.* 480 F.3d 1348, 82 USPQ2d 1321 (Fed. Cir. 2007) citing *Dystar Textilfarben GMBH v. C. H. Patrick Co.*, 464 F.3d 1356 (Fed. Cir. 2006).

42. For the above reasons and in the absence of convincing evidence to the contrary, the rejection is maintained.

Conclusion

43. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

44. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

45. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bradley L. Sisson whose telephone number is (571) 272-0751. The examiner can normally be reached on 6:30 a.m. to 5 p.m., Monday through Thursday.

46. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Schultz can be reached on (571) 272-0763. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

47. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Bradley L. Sisson/
Primary Examiner, Art Unit 1634